UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/388,286	09/01/1999	GUY T. BLALOCK	150.01010101	3697

7590 11/21/2002

ATTENTION KEVIN W RAASCH
MUETING RAASCH & GEBHARDT PA
POST OFFICE BOX 581415
MINNEAPOLIS, MN 554581415

EXAMINER	
SODERQUIST, ARLEN	
ART UNIT	**PAPER NUMBER**
1743	12

DATE MAILED: 11/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/388,286	Blalock
Examiner	**Art Unit**
Arlen Soderquist	1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Sep 18, 2002*.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1, 3, 6-21, and 28* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1, 3, 6-21, and 28* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

1. Due to the comments in the response received April 30, 2002 relative to the previous rejection under 35 U.S.C. 112 1st paragraph, applicant is prohibited from arguing that the alert is anything more than a change in the conductivity being noticed or the structure for generating an alert being more complex than structure that can convert the measurement into a value that is readable by an operator. Thus any device which displays the measurement inherently meets the claimed structure or step for generating an alert. The basis for this is that the minimum requirements for the detector as found on page 9, lines 4-8 of the instant specification and the claims is an electrical circuit capable of detecting the conductivity change between the electrodes. Lines 15-19 of the same page teach that a change in conductivity of the detection surface can be used to indicate the presence of ruthenium oxide gas in the area thereby alerting personnel in the area or those monitoring the area of a potential hazard. In these two statements there is no structure present that requires anything more than a means to display the change in conductivity. The simplest form that this could take is a display of the conductivity being measured. Hence due to a lack of any specific structure for generating an alert and the scope of the above disclosure in the instant specification, a display or meter showing the conductivity cannot be excluded from the scope of the instant claims.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 12, 15-17 and 19-20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hacman (GB 1,151,482) or N.V. PHILIPS (FR 1576658).

In the published application Hacman teaches temperature measurement for forming thin films on substrates by vacuum vapor deposition. The temperature (100-400°) of glass substrates in the vacuum vapor deposition of metals is controlled by measuring the electrical resistance of a strip of identical deposit-free glass between two electrodes. To avoid polarization, the measuring current is a.c. Both warming and reliable temperature control of the substrate lead to better

adherence of the deposited metal. Page 1, lines 65-75 teach of the known use of conductivity to measure a layer growing on a heated surface. Page 2, lines 65-71 teach the application of the device to automatic vapor deposition plants in which control devices permit vapor deposition when a particular resistance value has been reached. Figure 1 shows the sensor which is a glass substrate (page 2, lines 22-29, a preferential deposition material according to claim 19) with two electrodes.

In the published application N.V. PHILIPS teaches thin-film metal oxide resistors. Metal oxide films having high resistances (1-500 kilohms/square) are fabricated by depositing (e.g. by evaporation in a vacuum) a series of metal films (e.g., Nichrome). Each film in the series is oxidized almost completely before deposition of the following one. Both the deposition and the oxidation of each layer are monitored by measuring the resistance of similar layers deposited onto a nearby glass substrate (a preferential deposition material according to claim 19) which has electrodes and leads already attached. For Nichrome films, the substrate temperature is 350° and deposition of a given layer is halted when the resistance of the control film has decreased to 200 kilohms/square. The air pressure in the bell jar is then increased to 6×10^{-4} torr and oxidation proceeds until the resistance of the control stops increasing. The pressure is then reduced, and subsequent layers are added. An alternative method, yielding films of greater uniformity and higher resistivity, involves evaporating the Nichrome $(1\text{-}5) \times 10^{-5}$ torr. Oxidation can then occur to some extent while evaporation proceeds, but is completed only by interrupting evaporation periodically to allow oxidation at higher pressures.

4. Claims 12-14, 16, 20 and 32-35 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tyutnev. In the paper Tyutnev teaches apparatus for measuring the radiation-induced surface conductivity in polymers. All aspects of radiation-induced surface conductivity in polymers are discussed with emphasis on the role of the bulk processes during measurement and possible side effects connected with low-energy secondary electrons. The conventional scheme of surface conductivity measurements is especially sensitive to secondary electrons and is fully controlled by secondary emission. A proposed 4-probe technique eliminates both these factors (bulk contribution as well as secondary emission). Conformal mapping is used to predict the

electric field distribution in this geometry and across the gap between the source and drain electrodes. Figure 1 and its associated discussion teach a structure which anticipates the above claims.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1, 3, 6-21 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koda in view of Ohlsson or Yuan and Hacman, N.V. PHILIPS or Tyutnev as discussed above. In the paper Koda (see abstract) teaches a determination of ruthenium (Ru). Because of the paucity of analytical data for Ru in materials in general, Ru was determined in a large number of inorganic compounds and 2 types of seaweeds by neutron activation. The sample was oxidized, the volatile RuO_4 was captured on a polyethylene film placed on the mouth of the flask, and the film was irradiated in a reactor with neutrons. Since the NaI(Tl) detector had low resolution, the 511-keV peak had to be subtracted in order to obtain the area under the ^{103}Ru 497-keV peak. When using a 1-g sample, the detection limits were 1 and 5 ppb Ru with a Ge(Li) and NaI(Tl) detector, respectively. The table shows the results for several materials. Koda does not teach conductometric detection or using a glass or polypropylene surface for depositing the ruthenium.

In the paper Ohlsson discusses the use of ruthenium tetroxide in studies of polymer blends by scanning electron microscopy. Flat samples of blends of polypropylene (I) and triblock SBR

rubber or hydrogenated SBR (SEBS) were contrasted with RuO_4 and studied in a SEM provided with a detector for back-scattered electrons. The images showed the SEBS phase as bright areas with dark dots and the I phase as dark. The dots in the bright SEBS areas corresponded to the unstained EB-domains of the triblock SEBS polymer. The technique used provided back-scattered electron detector images of high resolution. This is a consequence of the intrinsic electrical conductivity conferred to the sample surface by the Ru species deposited there during staining. Treatment with RuO_4 vapor conferred electrical conductivity to the stained areas, which explains the high resolution obtained with the technique.

In the paper Yuan teaches low-temperature chemical vapor deposition of ruthenium dioxide from ruthenium tetroxide as a simple approach to high-purity RuO_2 films. RuO_2 films were prepared by vapor deposition from RuO_4 on a variety of substrates including glass, silicon and aluminum. The RuO_4 precursor could be used in pure form or as a solution in H_2O, CCl_4 or pentane. The best films, as judged by both purity and adhesion, were obtained with pure RuO_4 as precursor by CVD at atmospheric pressure, by using a horizontal hot-wall reactor with the substrate at 150°. The RuO_2 films were characterized by conductivity and by XPS, XRD and SEM/EDX analyses. Overlayers of lead zirconate titanate (PZT) were then prepared and hysteresis in the $Si/RuO_2/PZT/Au$ structure was demonstrated.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the device and methods of Hacman, N.V. PHILIPS or Tyutnev to detect the ruthenium compounds of Koda because of the recognized conductivity of the deposited materials as taught by Ohlsson or Yuan and the ability to measure them conductometrically will remove the need for radioactive materials in the detection.

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1, 3, 6-21 and 28 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-57 of copending Application No. 09/652,634, now US Patent 6,479,297. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant claim scope totally encompasses the scope of the claims of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

9. Applicant's arguments filed September 18, 2002 have been fully considered but they are not persuasive. Relative to the request for retraction of a statement in the last office action, examiner stands by the previous statement and has added explanation of where the basis for the statement was found. The application is devoid of any specific structure or specific suggestion of the form the alert could be generated. However the claims and the specification require the detector to have as a minimum an electrical circuit capable of detecting the conductivity change between the electrodes. Lines 15-19 of page 9 of the specification teach that a change in conductivity of the detection surface can be used to indicate the presence of ruthenium oxide gas in the area thereby alerting personnel in the area or those monitoring the area of a potential hazard. In the minimum structure required for the detector and the description of page 9 there is no structure present that requires anything more than a means to display the change in conductivity. The simplest form that this could take is a display of the conductivity being measured since it is the change in conductivity that can be used to indicate the presence of

ruthenium. Hence due to a lack of any specific structure for generating an alert and the scope of the above disclosure in the instant specification, a display or meter showing the conductivity cannot be excluded from the scope of the instant claims. The previous rejection under 35 U.S.C. 112 1st paragraph was withdrawn on the basis of applicant's arguments which pointed to these sections as providing the written description necessary to show that applicant was in possession of the invention. The statement does not prevent a claim from covering detector structure which has a more complex alarm generating structure. It simply sets forth the minimum structure required based on the description in the instant specification for the alarm generation. Thus any arguments relative to the generation of an alarm being more complex than is found in the references is not commensurate in scope with the instant claims and specification.

Relative to the rejections over the Hacman and N. V. Philips references applicant is directed to claim 19 for the basis for glass being a material upon which ruthenium preferentially deposits. Additionally the instant device as well as the devices of Hacman and N. V. Philips are not capable of differentiating between ruthenium and another deposited substance that increases the conductivity. Therefore a recitation of the intended use of the claimed device for measuring ruthenium must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Since the only measured property is conductivity and other substances are known to change the conductivity the fact that the device is being used to measure ruthenium carries no patentable moment for claims to the device. As such these references are clearly anticipatory of the scope of claims 12, 15-17 and 19-20 drawn to a glass substrate with two electrodes thereon and means to measure the conductivity between the electrodes. Relative to the Tyutnev reference, applicant is directed to claims 13-14 for a showing that the polymers of the reference are materials that preferentially deposit ruthenium.

Relative to the combination of references applicant is directed to the fact that an obviousness rejection implies that the primary reference is missing structure and or methods steps

as required by the claims being rejected. In this case it is the Koda reference which is being modified and the secondary references show first that the film formed in the Koda detection process would have been recognized by one skill in the art to be conductive (Ohlsson or Yuan). The secondary references also show that conductive films can be detected by using an electrical measurement on a with a structure as required by the claims (Hacman, N.V. PHILIPS or Tyutnev). The newly cited and applied references address the changes in the claims and applicant's arguments relative to the method claims.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional art relates to sensing of materials in which conductivity is measured.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose telephone number is (703) 308-3989. The examiner's schedule is variable between the hours of about 5:30 AM to about 5:00 PM on Monday through Thursday and alternate Fridays.

For communication by fax to the organization where this application or proceeding is assigned, (703) 305-7719 may be used for official, unofficial or draft papers. When using this number a call to alert the examiner would be appreciated. Numbers for faxing official papers are 703-872-9310 (before finals), 703-872-9311 (after-final), 703-305-7718, 703-305-5408 and 703-305-5433. The above fax numbers will generally allow the papers to be forwarded to the examiner in a timely manner.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Arlen Soderquist

November 18, 2002

ARLEN SODERQUIST
PRIMARY EXAMINER